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LIST OF PUBLICATIONS AND PATENTS (WITH ABSTRACTS) ON FREEZING PRESERVATION OF FRUITS, VEGETABLES, POULTRY, AND POULTRY PRODUCTS (1952 to 1954)

WESTERN UTILIZATION RESEARCH BRANCH
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Agricultural Research Service
UNITED STATES DEPARTMENT OF AGRICULTURE

OBTAINING INFORMATION

Publications with AIC preceding their numbers (for example AIC-340) are mimeographed, and supplies are maintained for free distribution. A limited number of reprints of journal articles are available, usually for a short period following publication. The asterisk (*) before a title indicates that the supply of reprints of that publication was exhausted at the time this list was prepared. Photoprints of any single article can be obtained for $1.00 for each 7 pages or fraction thereof from the Library of the United States Department of Agriculture, Washington 25, D.C. Copies of patents must be purchased from the United States Patent Office, Washington, D. C., for 25 cents each.

Publications and Patents on Frozen Foods
Western Utilization Research Branch

AIC-326, LIST OF PUBLICATIONS AND PATENTS (WITH ABSTRACTS) ON FREEZING PRESERVATION OF FRUITS, VEGETABLES, POULTRY, AND POULTRY PRODUCTS OF THE WESTERN REGIONAL RESEARCH LABORATORY, December, 1951. This is a list of all the publications related to the freezing preservation of foods issued by this Laboratory from the time the Laboratory was established through 1951.

Analytical Methods for Quality Control and Research

SENSORY TEST METHODS. I. THE TRIANGLE INTENSITY (T-I) AND RELATED TEST SYSTEMS FOR SENSORY ANALYSIS. J. G. Davis and H. L. Hanson, Food Technol. 8(7):335-39, July, 1954. A method for the calculation of levels of significance has been developed in which use is made of the information contained in partially correct judgments for 3 or more samples that represent two levels of intensity of a given quality. A method for the graphical estimation of significance levels for the 3-sample test is presented.

COMPARISON OF BORIC ACID AND LACTOSE BROTHS FOR THE ISOLATION OF ESCHERICHIA COLI FROM CITRUS PRODUCTS. E. R. Wolford, Applied Microbiol. 2(4):223-27, July, 1954. The effectiveness of buffered boric acid lactose broth developed by Vaughn and Levine has been compared with that of standard lactose broth for isolation of E. coli from citrus products, particularly frozen orange juices. Boric acid broth proved to be preferable because it gave higher E. coli recovery along with smaller numbers of Aerobacter, intermediates, and false positive tests.

MEASUREMENT OF FOOD CHARACTERISTICS. APPLICATION OF POTENTIOMETRIC ROTARY VISCOMETER TO MEASURING CONSISTENCY OF FOOD PUREES AND PASTES. R. J. McColloch and E. A. Beavens, Jour. Agr. and Food Chem. 2(19):986-90, Sept. 15, 1954. A rotary viscosimeter assembly with uniquely designed rotors has been successfully applied to the measurement of consistency of thick food pastes and purees.

EXTRACTION AND DETERMINATION OF TOTAL PECTIC MATERIALS IN FRUITS. R. M. McCready and E. A. McComb, Analyt. Chem. 24(12):1986-88, Dec., 1952. The proposed extraction procedure is simple, requires little of the analyst's time, and is specific for pectic substances. A micro colorimetric carbazole method is used to determine the anhydrouronic acid content of the solution.

REVERSIBLE INACTIVATION OF POLYPHENOL OXIDASE. J. D. Ponting, Jour. Amer. Chem. Soc. 76(3):662-63, Feb. 1954. Measurements of activity of polyphenol oxidase preparations on catechol have revealed a type of inactivation or inhibition of enzyme that is reversible by ascorbic acid and differs from the "reaction inactivation" that occurs in the presence of excess ascorbic acid.

PLANT STARCH ANALYSIS. RAPID DETERMINATION OF STARCH IN APPLES. G. H. Carter and A. M. Neubert, Jour. Agr. and Food Chem. 2(21):1070-72, Oct. 13, 1954. A rapid colorimetric starch procedure was developed for use on apples in the maturity range of commercial harvest and storage. The method is accurate for Jonathan, Golden Delicious, standard Delicious, and Winesap over this maturity range. One-fourth of the starch in these varieties appears to be amylose.

RAPID METHOD FOR MOISTURE IN FRUITS AND VEGETABLES BY OXIDATION WITH DICHROMATE. II. PINEAPPLE-RICE PUDDING, RICE, PRUNES, AND CORN. Y. Tomimatsu and H. F. Launer, Food Technol. 6(8):281-85, Aug., 1952. The rapid, simple method for moisture determination in fruits and vegetables, based upon oxidation with potassium dichromate solution, has been applied to pineapple-rice pudding, rice, prunes, and fresh frozen corn, and the precision and accuracy for these commodities determined. A large number of samples of each, representing different batches, varieties, crops, maturity levels, and processing procedures, were studied.

D-FRUCTOSE DIHYDRATE. F. E. Young, F. T. Jones, and H. J. Lewis, Jour. Phys. Chem. 36(6):738-39, June, 1952. The discovery, preparation, and properties of a new crystalline di-hydrate of B-D-fructose are described.

D-FRUCTOSE-WATER PHASE DIAGRAM. F. E. Young, F. T. Jones, and H. J. Lewis, Jour. Phys. Chem. 56(9):1093-96, Dec., 1952. The D-fructose-water system has been studied between -30° and +40°C. Well defined crystalline phases studied include anhydroud D-fructose, stable above +21.4°C.; D-fructose hemihydrate, stable between +21.4° and +19.9°C.; data are given for a crystalline phase, which appears to be a metastable form of D-fructose dihydrate. A D-fructose gel is described and the approximate range of solution concentrations in which it can exist have been determined between -20° and +10°C.

OPTICAL AND CRYSTALLOGRAPHIC PROPERTIES OF SUCROSE HEMIHEPTAHYDRATE. F. T. Jones and F. E. Young, Analyt. Chem. 26(2):421, Feb. 1954. The composition and optical and crystallographic properties of sucrose hemiheptahydrate crystals grown at -7.5°C. are reported as determined by the methods of chemical microscopy.

Precooked Frozen Foods

*RECENT DEVELOPMENTS IN PRECOOKED FROZEN FOODS. H. L. Hanson, Jour. Amer. Dietetic Assoc. 39(3):241-44, March, 1954. A general review.

EFFECT OF ANTIOXIDANT ON RANCIDITY DEVELOPMENT IN FROZEN CREAMED TURKEY. H. Lineweaver, J. H. Anderson, and H. L. Hanson, Food Technol. 6(1):1-4, Jan., 1952. Presence of an antioxidant during cooking of turkey to be used in precooked frozen foods had a beneficial effect in preventing development of rancid flavors and peroxide both during cooking and during subsequent frozen storage. Addition of antioxidant during preparation of the cream sauce rather than during cooking of the turkey further retarded development of rancid flavors and peroxide.

RESEARCH MAKES FROZEN COOKED POULTRY PRODUCTS A REALITY. H. L. Hanson, Poultry Processing and Marketing 60(6):12, 20, June 1954; 60(8):17, 28-30, Aug. 1954. A general review of recent progress and of achievements and problems.

*PROCESSING PRE-COOKED FROZEN POULTRY PRODUCTS. H. L. Hanson, Indus. Refrig. 127(1):31, July, 1954. A review of problems in the production of frozen fried chicken, creamed poultry products, and frozen hard cooked eggs.

CHARACTERIZATION OF THE EFFECT OF FREEZING ON COOKED EGG WHITE. J. G. Davis, H. L. Hanson, and H. Lineweaver, Food Research 17(4):393-401, July-Aug., 1952. In precooked frozen foods, cooked egg white becomes granular, rubbery, and watery and separates into clumps. Studies conducted did not solve the problem but did reveal some basic factors involved. During ordinary freezing, ice crystals grow and damage the structure. During thawing, the watery phase is not reabsorbed. Variation in time of cooking revealed no improvement. Damage was reduced somewhat by rapid freezing following supercooling, which was most frequently obtained in the 0° to -10°F. range. Variation in pH of the white was not beneficial. Additives such as salt, glucose, glycerin, and vegetable gums gave no improvement but gelatin gave some improvement, apparently because it increased the frequency of supercooling.

*FREEZING OF COOKED POULTRY AND EGG PRODUCTS. H. L. Hanson, Frosted Food Field 19(1):20-21, July, 1954. A summary of studies on the following frozen products: fried chicken, creamed chicken and related products, creamed turkey and related products, and desserts containing eggs. Effects of temperature on storage stability of these products are discussed.

*FROZEN COOKED RICE. II. BROWN RICE. M. M. Boggs, A. C. Ward, C. N. Sinnott, and E. B. Kester, Food Technol. 6(2):53-54, Feb., 1952. Samples of brown rice were cooked by approximate methods, frozen, stored at 0°F., and tasted after a year of storage. The quality of the frozen product was equivalent to that of freshly prepared samples.

*WAXY RICE FLOUR IMPROVES FROZEN CANNED FOODS. H. Lineweaver, Rice Jour. 57(10):20, Oct., 1954. A summary of research on use of waxy rice flour in frozen and heat-processed canned foods.

WAXY RICE FLOUR IMPROVES FROZEN AND CANNED PRECOOKED FOODS. H. Lineweaver, Research Achievement Sheet 173, 2 pages, Agricultural Research Service, U.S. Dept. of Agriculture, Sept., 1954. A summary of achievement in research, with selected references and estimate of costs.

PREPARATION OF STABLE FROZEN PUDDINGS. H. L. Hanson, K. D. Nishita, and H. Lineweaver, Food Technol. 7(1):462-65, Nov., 1953. Preparation of desserts of a cornstarch-pudding or soft-custard consistency that are stable to freezing and limited frozen storage is described. Elimination of the separation and curdled appearance of products prepared by the usual formulas is accomplished by substitution of waxy rice flour for part or all of the usual thickening agents.

Dehydrofrozen Fruits and Vegetables

DEHYDROFREEZING OF FRUITS AND VEGETABLES. W. F. Talburt and F. E. Lindquist, Food Science Abstracts 26(4):361-368, July, 1954. A review of work done at Western Utilization Research Branch on the dehydrofreezing of fruits and vegetables.

NEW THROUGH FLOW ROTARY DRIER FOR THE PARTIAL DRYING OF APPLE SLICES. W.D. Rockwell, E. Lowe, G. S. Smith, and M. J. Powers, Food Technol. 8(11):500-502, Nov., 1954. A new type of through-flow rotary drier developed to dehydrate apple slices partially in preparation for dehydrofreezing is described.

FRUITS

ENZYMATIC BROWNING OF FRUITS. III. KINETICS OF THE REACTION INACTIVATION OF POLYPHENOLOXIDASE. L. L. Ingraham, J. Corse, and B. Makower, Jour. Amer. Chem.Soc. 74(10):2623-26, May, 1952. In the enzymatic oxidation of catechol by apple enzyme in the presence of an excess of ascorbic acid the amount of catechol oxidized (as measured by the ascorbic acid destroyed by the o-quinone or semiquinone produced) is proportional to the amount of enzyme added.

AIC-340, METHODS USED AT WESTERN REGIONAL RESEARCH LABORATORY FOR EXTRACTION AND ANALYSIS OF PECTIC MATERIALS. H. S. Owens, R. M. McCready, A. D. Shepherd, T. H. Schultz, E. L. Pippen, H. A. Swenson, J. C. Miers, R. F. Erlandsen, and W. D. Maclay, June, 1952. Methods used in the Western Regional Research Laboratory for the extraction, isolation, purification, and analysis of pectic substances are described. Later pages contain references and a list of current nomenclature of pectic substances and enzymes.

METHODS FOR IMPROVING FRUIT PRODUCTS. Patent No. 2,563,855 to R.J.McColloch and E. A. Beavens, Aug. 14, 1951. Relates to the processing of fruit products, particularly citrus products. The main object of the invention is to provide methods for preventing formation of clumps and/or gel-like structures in fruit products, without resorting to the necessity of heating the product to inactivate the naturally occurring enzymes.

*FROZEN FRUIT JUICE CONCENTRATES. E. G. Hellier, H. C. Weingartner, M. K. Veldhuis, G. E. Felton, and R. R. Legault. (The last-named author was employed at this Laboratory during preparation of this chapter.) Chapter 8, Refrigerating Data Book, Applications Volume, 1952, published by American Society of Refrigerating Engineers, New York City. Frozen concentrates of orange, grapefruit, tangerine, pineapple, and apple juices are discussed.

DEHYDROFREEZING OF FRUITS AND VEGETABLES. W. F. Talburt and F. E. Lindquist, Food Science Abstracts 26(4):361-68, July, 1954. A review of work done at Western Utilization Research Branch on the dehydrofreezing of fruits and vegetables.

NEW THROUGH-FLOW ROTARY DRIER FOR THE PARTIAL DRYING OF APPLE SLICES. W.C. Rockwell, E. Lowe, G. S. Smith, and M. J. Powers, Food Technol. 8(11):500-502, Nov., 1954. A new type of through-flow rotary drier develcped to dehydrate apple slices partially in preparation for dehydrofreezing is described.

SUGAR IN FROZEN FOODS. W. F. Talburt. In Advances in Chemistry Series, No. 12, Uses of Sugars and Other Carbohydrates in Food Industry. A report on use of sugars and other types of sweeteners in frozen foods. Sucrose has been found the most acceptable, since it does not limit the end-use of the product. Dextrose, dextrose hydrate, or corn sirup can be used to replace up to one-third of the normal sucrose requirement in most frozen fruits without adversely affecting color, flavor, or texture of product. High-conversion corn sirup or corn sirup solids, alone or in combination with other sweeteners, can also be used.

Apples

JUICE QUALITY OF DELICIOUS APPLES AS AFFECTED BY METHOD OF FRUIT HANDLING. A. M. Neubert, G. H. Carter, J. L. Henry, J. E. Brekke, D. W. Graham, A. Van Doren, and R. M. Bullock (with Tree Fruit Experiment Station, part of Washington Agricultural Experiment Stations, Wenatchee, Wash.), Food Technol. 7(8):324-29, Aug., 1953. Wide differences were found in quality of juices obtained from standard Delicious apples, depending on their maturity, grade, and preprocessing treatment. Ripening after harvest was the most important factor in improving juice quality of this variety.

CHANGES IN COMPOSITION OF NORTHWEST STANDARD DELICIOUS APPLES DURING STORAGE THAT AFFECT THEIR SUITABILITY FOR JUICE PRODUCTION. L. R. Leinbach, W. F. Talburt, and E. W. Carlsen (with Washington State Apple Commission), Food Technol. 7(10):404-08, Oct., 1953. Juice was pressed from two grades of standard Delicious apples, obtained from commercial packing houses, and assayed for total solids, total and reducing sugars, titratable acidity, pH, color, and suitability for juice manufacture.

PLANT STARCH ANALYSIS. RAPID DETERMINATION OF STARCH IN APPLES. G.H. Carter and A. M. Neubert, Jour. Agr. and Food Chem. 2(21):1070-72, Oct. 13, 1954. A rapid colorimetric starch procedure was developed for use on apples in the maturity range of commercial harvest and storage. The method is accurate for Jonathan, Golden Delicious, standard Delicious, and Winesap over this maturity range. One-fourth of the starch in these varieties appears to be amylose.

NEW APPLE SHERBET FLAVOR. D. G. Guadagni, L. H. Walker, W. F. Talburt, and R. Farris (with Borden Dairy Delivery Co.), Ice Cream Field 59(3):26, March, 1952. Diced fresh apple impregnated with concentrated apple juice is incorporated into sherbet. The juice has been concentrated after removal of essence, which is also concentrated and returned to the juice. This method gives a true apple flavor to sherbet.

FROZEN APPLE JUICE CONCENTRATE: PERMISSIBLE TEMPERATURES FOR CONCENTRATION OF WESTERN VARIETIES OF APPLES. L. H. Walker, D. C. Patterson, and V. S. Seamans, Food Technol. 8(2):108-10, Feb. 1954. Results of investigations concerning effects of various temperatures during concentration upon changes in flavor of juices from various varieties of Western apples are reported and discussed.

INFLUENCE OF STORAGE CONDITIONS ON FROZEN AND CANNED APPLE JUICE CONCENTRATES. C. C. Nimmo, L. H. Walker, and V. S. Seamans, Food Technol. 6(1):31-35, Jan. 1952. Apple juice concentrates prepared by 3 different methods have been stored at 0°F. and 75°F. and changes in flavor, color, and iron concentration have been followed. Storage at 0°F. for one year produced no important flavor changes. Storage at 75°F. for more than 3 months caused development of an objectionable amount of off flavor.

*FRUIT-CONTAINING FROZEN CONFECTIONS AND PROCESS FOR PRODUCING THE SAME. Patent No. 2,651,575 to W. F. Talburt and D. G. Gaudagni, Sept. 8, 1953. Pieces of fruit, such as diced apples, are impregnated with full-flavored concentrated fruit juice. The fruit pieces are then incorporated in a frozen confection such as sherbet or ice cream. The impregnation increases the solids content of the fruit and enhances its flavor so that the pieces remain soft and free from iciness and have a better flavor than would pieces of untreated fruit.

Apricots

DEGREE OF HEAT INACTIVATION OF POLYPHENOL OXIDASE AND QUALITY OF FROZEN APRICOT PUREE. J. D. Ponting, R. S. Bean, G. K. Notter, and B. Makower, Food Technol. 8(12):573-75, Dec. 1954. Apricot puree was given various heat treatments with respect to time and temperature and then frozen and stored for 3, 6, and 12 months at 4 different sub-freezing temperatures. It was found that the best quality of puree was obtained by heating just enough to completely inactivate the polyphenol oxidase. Less heating allowed rapid browning and resulted in an oxidized flavor, while excessive heating caused a cooked and sometimes bitter flavor.

Cane Berries

*STUDIES ON REMOVAL OF THRIPS FROM CANE BERRIES INTENDED FOR PROCESSING. J. E. Brekke, C. C. Nimmo, H. A. Swenson, C. E. Samuels, and J. R. Brock (with Oregon State College). Proc. 5th Ann. Pacific Northwest Industrial Waste Conf., Washington State College, 1953 (processed), pp. 62-66, discussion on pages 67-8. A summary of studies on use of wetting agents in cleaning solutions for removal of thrips. (Information essentially same as in AIC-353, Feb. 1953.)

AIC-353, STUDIES ON REMOVAL OF THRIPS FROM CANEBERRIES INTENDED FOR PROCESSING. J. E. Brekke, C. C. Nimmo, H. A. Swenson, C. E. Samuels, and J. R. Brock (with Oregon Agricultural Experiment Station, Corvallis), Feb. 1953, mimeographed, 5 pages. A progress report on studies conducted during the 1952 season in Oregon to determine the effectiveness of various combinations of dry and wet methods for removing thrips from harvested black and red raspberries intended for canning or freezing. (Reprinted in Canning Trade, 95(52):7-8, July 1953.)

Citrus Fruits

FROZEN PUREES FROM CITRUS FRUITS. E. A. Beavens. Research Achievement Sheet 158(C), 2 pages, Agr. Research Admin., U.S. Dept. of Agr., March, 1953. A summary of achievement in research, with selected references and estimate of costs.

FRUIT CONCENTRATES. FLAVOR FORTIFIED HIGH DENSITY FROZEN CITRUS CONCENTRATES. R. G. Rice, G. J. Keller, R. J. McColloch, and E. A. Beavens, Jour. Agr. and Food Chem. 2(4):196-98, Feb. 1954. Full-flavored high-density frozen orange juice and grapefruit juice concentrates were prepared successfully by adding appropriate amounts of cold-pressed peel oil to juice concentrates of the desired level of concentration.

FLAVOR FORTIFICATION OF CALIFORNIA FROZEN ORANGE CONCENTRATE. R. G. Rice, G. J. Keller, and E. A. Beavens, Food Technol. 6(1):35-39, Jan. 1952. Results of an investigation of the volatile materials evolved during evaporation of California Valencia oranges are presented. Under the conditions of these experiments, the volatile aroma and flavor lost during evaporation could be restored by addition of cold-pressed peel oil or of orange puree in place of the single-strength juice ordinarily used.

STABILIZATION OF FROZEN CITRUS CONCENTRATES BY HEAT TREATMENT. G. J. Keller, R. G. Rice, R. J. McColloch, and E. A. Beavens, Food Technol. 8(4):195-200, April 1954. A series of experiments indicated that direct steam injection can be used to effect a wide range of heat treatments which result in increased cloud stability without causing detectable flavor damage. There appears to be a significant effect upon cloud stability, depending on combination of concentration and temperature of heat treatment. The degree of cloud stabilization showed a general but not quantitative agreement with the amount of pectinesterase inactivated.

*METHODS FOR IMPROVING FRUIT PRODUCTS. Patent No. 2,563,855 to R. J. McColloch and E. A. Beavens, Aug. 14, 1951. Relates to processing of fruit products, particularly citrus products. The main object of the invension is to provide methods for preventing formation of clumps and/or gel-like structures in fruit products, without resorting to the necessity of heating the product to inactivate the naturally occurring enzymes.

COMPARISON OF BORIC ACID AND LACTOSE BROTHS FOR THE ISOLATION OF ESCHERICHIA COLI FROM CITRUS PRODUCTS. E. R. Wolford, Applied Microbiol. 2(4):223-27, July 1954. The effectiveness of buffered boric acid lactose broth developed by Vaughn and Levine has been compared with that of standard lactose broth for isolation of E. coli from citrus products, particularly frozen orange juices. Boric acid broth proved to be preferable because it gave higher E. coli recovery along with smaller numbers of Aerobacter, intermediates, and false positive tests.

Figs

*VARIETAL COMPARISON OF FRESH FIGS FOR FREEZING AND PRESERVE MANUFACTURE. M. J. Powers, Proc. Calif. Fig Inst., Annual Conference, March 3, 1953, Fresno, Calif., pp. 35-38, mimeographed. Studies on pH, sugar content, and enzymic activity (ficin) of fresh figs of three maturities and on freezing and preserve manufacture are reported. Certain varied additives such as pectin, fruit acid, and spices were used.

Peaches

EFFECT OF GROWING AREA ON TANNIN AND ITS RELATION TO ASTRINGENCY IN FROZEN ELBERTA PEACHES. D. G. Guadagni and C. C. Nimmo, Food Technol. 7(2):59-61, Feb. 1953. The tannin content of Elberta peaches from 3 different growing areas, of varying prevailing climatic conditions, was determined. Differences in relative astringency were directly related to differences in tannin content of fruit from the various areas.

*FACTORS AFFECTING THE DEGREE OF BROWNING IN FROZEN PEACHES STORED AT 20-28°F. D. G. Guadagni, M. M. Stithem, and C. C. Nimmo, Quick Frozen Foods 16(11): 46-8, June 1954. Increasing sirup volume, delayed freezing, slow freezing, and vacuum siruping all had a marked effect on browning in frozen peaches stored at 20-28°F. As the sirup density was increased, the degree of thawing and browning was also increased.

Prunes

PREPARATION OF FRESH ITALIAN PRUNE JUICE CONCENTRATES. L. H. Walker and D. C. Patterson, Food Technol. 8(4):208-10, April 1954. Information is presented concerning conversion of Italian prunes into attractive and tasty juice and juice concentrate products. Description of process, equipment, and results of investigations of effects of maturation before harvest, removal and return of essence, temperatures during concentration and temperatures during storage upon product are included.

Strawberries

EFFECT OF SUCROSE AND ASCORBIC ACID ON QUALITY RETENTION IN FRESH AND FROZEN STRAWBERRY PUREE. D. G. Guadagni, Food Research 19(4):396-401, July-Aug. 1954. Experiments on effect of sucrose and ascorbic acid on quality of fresh and frozen strawberry puree indicate that deteriorative changes in quality of fresh puree occur within 2 to 3 hours at room temperature and that sucrose neither prevents nor minimizes these changes. Addition of sucrose or ascorbic acid offered no advantage during freezing,storage,and defrosting.

CONCENTRATION OF STRAWBERRY JUICE. L. H. Walker, G. K. Notter, R. M. McCready, and D. C. Patterson, Food Technol. 8(8):350-52, Aug. 1954. Methods are presented for preparation of concentrated strawberry juice and for recovery of volatile flavor constituents. Causes of gelation of juice, clafification by use of pectic enzymes, effect upon product of varying percentages of evaporation during essence recovery, and effect of temperatures during concentration were determined.

VEGETABLES

DEHYDROFREEZING OF FRUITS AND VEGETABLES. W. F. Talburt and F.E. Lindquist, Food Science Abstracts. (See under Fruits.)

Brussels Sprouts

A RAPID TEST FOR ADEQUACY OF BLANCHING IN FROZEN BRUSSELS SPROUTS. M. P. Masure, W. C. Dietrich, F. E. Lindquist, and L. C. Blackwood, Food Technol. 7(9):363-66, Sept. 1953. In agreement with earlier work, the peroxidase test served as a satisfactory index of adequacy of blanching and offered a good margin of safety. Addition of a 0.5 to 3 percent solution of hydrogen peroxide to cut surfaces of sprout halves brought about a rapid development of pinkish-orange color in under-blanched materials. Extent of color development paralleled roughly the peroxidase content of the samples.

Lima Beans

EFFECTS OF PROCESSING ON ESTIMATES OF RAW STOCK MATURITY AND OF TEXTURAL QUALITY IN FROZEN LIMA BEANS. C. Sterling and M. M. Boggs, Food Technol. 8(5):235-39, May 1954. (With University of California, Davis.) Samples of Fordhook lima beans were subjected to experiments designed to measure correlations between taste panel scores and objective tests. Of the latter, only tenderometer values on the cooked product showed a highly significant correlation with panel scores.

Peas

FROZEN PEAS IMPROVED BY RESEARCH. H. S. Olcott, Research Achievement Sheet 159(C), 2 pages, Agr. Research Admin., U.S. Dept. of Agr., March, 1953. A summary of achievement in research, with selected references and estimate of costs.

COMPARISON OF METHODS FOR MEASURING THE MATURITY FACTOR IN FROZEN PEAS. R. U. Makower, M. M. Boggs, H. K. Burr, and H. S. Olcott, Food Technol. 7(1):43-48, Jan. 1953. Comparisons were made of the maturities of 68 samples of frozen peas as measured by various physical and chemical tests and as rated by panels of trained human judges. The samples represented 4 varieties, 3 seasons, and several harvest dates and size classes.

DEVELOPMENT OF OFF FLAVOR IN SHELLED PEAS HELD IN COLD WATER. R. U. Makower, M. M. Boggs, and H. K. Burr, Food Technol. 6(5):179-80, May 1952. Shelled Giant Stride peas held dry or submerged in water at different temperatures before blanching and freezing were organoleptically inferior to controls processed immediately after shelling. Off-flavor was stronger in submerged samples than in the dry. In general, the lower the temperature of holding, the less the off-flavor produced.

COMPARISON OF FROZEN AND DEHYDROFROZEN PEAS WITH FRESH AND STORED POD PEAS. M. M. Boggs and W. F. Talburt, Food Technol. 6(11):438-42, Nov. 1952. Frozen and dehydrofrozen peas processed in the laboratory were equal in quality to strictly fresh pod peas, except for small losses of sugar and ascorbic acid. No important chemical changes, other than changes in chlorophyll occurred in pod peas during 18 days' storage at 33°F., but at 75+F., rapid losses of sugar and ascorbic acid occurred. The analyses included total solids, total sugars, reduced ascorbic acid, thiamin, chlorophyll, pH, and color as measured by reflectance.

POULTRY

*SUBSCALDING VS. SEMISCALDING OF TURKEY. H. Lineweaver and A. A. Klose, Ice and Refrigeration 124(6):31, June 1953. A reprint of an article in Turkey World (see next entry below).

*SUB-SCALDING VS. SEMI-SCALDING. H. Lineweaver and A. A. Klose, Turkey World 27(11):18, 66, Nov. 1952. A review of comparative advantages and disadvantages of semi-scalding and sub-scalding for turkeys based on work at the Western Regional Research Laboratory and other research organizations.

WASTE FEATHERS CONVERTED TO FERTILIZER. G. H. Brother, Research Achievement Sheet 161(C), 2 pages, Agr. Research Admin., U. S. Dept. Agr., April 1953. A summary of achievement in research, with selected references and estimate of costs.

EFFECT OF SCALDING TEMPERATURE ON THE PROCESSING AND INITIAL APPEARANCE OF TURKEYS. M. F. Pool, E. P. Mecchi, H. Lineweaver, and A. A. Klose, Poultry Sci. 33(2):274-79, March 1954. Turkeys were scalded at 120° to 140°F. for 60 seconds and at 125°F. for 30, 60, and 120 seconds. Feather pulling force was established as a reliable objective method of measuring efficiency of feather removal by various scalding procedures. Appearance of the freshly slaughtered, high-temperature-scalded turkey was shown to be acceptable if moisture losses were controlled.

EFFECT OF SCALDING TEMPERATURE ON QUALITY OF STORED FROZEN TURKEYS. A. A. Klose and M. F. Pool, Poultry Sci. 33(2):280-89, March 1954. Turkeys that had been subjected to various experimental conditions of scalding, chilling, and packaging were stored at -5°F. for periods up to 12 months and then evaluated. The high-temperature-scalded turkey was shown to be an acceptable product for frozen storage if moisture losses were controlled from slaughter through consumption.

*BACTERIOLOGY OF COMMERCIAL POULTRY PROCESSING. M. F. Gunderson, H. W. McFadden, and T.S. Kyle, Burgess Pub. Co., Minneapolis, Minn., 98 pages (processed) 1954. Research reported was conducted under contract in the College of Medicine, University, Omaha. Studies are reported on fresh frozen, frozen precooked, and cooked boned products. Factors that contribute to variations in bacterial populations of products are discussed. Some concepts important to the frozen food industry in the production of improved products are developed.

RELATIVE EFFICIENCY OF DIFFERENT CULTURE MEDIUMS IN ISOLATION OF CERTAIN MEMBERS OF THE SALMONELLA GROUP. N. B. McCullough and A. F. Byrne. (University of Chicago, research conducted under contract.) Jour. Infect. Diseases 90(1):71-75, Jan.-Feb. 1952. Data showing relative efficiency of a variety of media in detecting certain strains of Salmonella in presumptively positive fecal specimens is presented. The species of Salmonella used were: S. meleagridis, S. anatum, S. newport, S. bareilly, S. derby, and S. pullorum.

SURVIVAL AND MULTIPLICATION OF MICROCOCCUS PYOGENES VAR. AUREUS IN CREAMED CHICKEN UNDER VARIOUS HOLDING, STORAGE, AND DEFROSTING CONDITIONS. R. P. Straka and F. M. Combs, Food Research 17 (5):448-55, Oct. 1952. Results indicate that, under the conditions of the experiments, containers of creamed chicken should not be held for more than 2 hours before being placed in the freezer, whereas quickly frozen samples can be defrosted at room temperature over a 10- to 11-hour period without development of excessive counts (60,000 per gram for the uninoculated containers and about 600,000 for containers initially inoculated with about 370,000 organisms per gram). Freezing without delay is more important than thawing without delay.

*STABILIZATION OF DEHYDRATED VEGETABLE MATERIAL. Patent 2,686,123 to T. W. Campbell and G. M. Coppinger, Aug. 10, 1954. This patent concerns the use of acylpyrogallols, such as acetyl pyrogallol, propionyl pyrogallol, etc., as antioxidants for stabilizing materials such as fats, food products containing fats, feed materials which contain carotene, etc.

WOOL

COMPARISON OF WOOLS BETWEEN AND WITHIN SEVERAL BREEDS OF SHEEP. R. A. O'Connell and H. P. Lundgren, Text. Res. Jour. 24(7):677-685, July, 1954. Studies of wools from 5 breeds of sheep, raised under the same environmental and dietary conditions, are reported. Certain mechanical properties have been evaluated and differences shown to exist among breeds and also within breeds. The dependency of mechanical properties on fineness of wool has been found to vary in a manner which indicates that crimp in fiber strongly influences mechanical properties.

EFFECT OF CRIMP ON MECHANICAL PROPERTIES OF WET WOOL. R. A. O'Connell and A. S. Yeiser, Text. Res. Jour. 24(7):629-632, July, 1954. Wool fibers of various degrees of crimpiness have been segregated into groups and their mechanical properties have been compared. It is apparent that degree of crimpiness affects tensile properties and that wools of a given fiber diameter with differing crimp vary in mechanical properties. This characteristic is seemingly independent of breed.

APPLICATION OF RHODAMINE-B TO INTERACTION STUDIES IN PROTEINS AND SIMPLE MODEL SYSTEMS. H. P. Lundgren and C. H. Binkley, Jour. Polymer Science 14(74):139-158, Aug., 1954. A discussion of aspects of interaction forces which determine the activity of rhodamine-b in nonpolar and aqueous solutions, with emphasis on hydrogen bonding with dye.

DIELECTRIC PROPERTIES OF WOOL-WATER SYSTEMS AT 3000 AND 9300 MEGACYCLES. J.J. Windle and T. M. Shaw, Jour. Chem. Phys. 22(10):1752-57, Oct., 1954. The dielectric constant and dielectric loss have been determined. Water content of the fibers was varied between 0 and 15 percent of the weight of the dry wool. Results show that both increase with increasing amounts of sorbed water.

A MULTIPLE-UNIT STRESS RELAXOMETER. W. J. Thorsen, Text. Res. Jour. 24(10): 899-902, Oct., 1954. Application of an improved resistance-wire strain gage to a multiple-unit instrument for measurement of stress-relaxation in single fibers is described. The instrument is stable over long periods and is designed to record directly in units of stress, the scale being identical for all fibers.

PHYSICAL-CHEMICAL STUDIES RELATED TO THE ROLE OF WHITENESS-RETENTION ADDITIVES IN DETERGENT ACTION. W. Fong and W. H. Ward, Text. Res. Jour. 24(10):881-889, Oct., 1954. Physical chemical studies have been carried out on the mode of action of whiteness-retention additives in decreasing the extent of soil redeposition during laundering. Electrophoresis, sedimentation and adsorption analysis have been used.

*WOOL--FROM FLEECE TO FABRIC (abstract), R. A. O'Connell, Stockmen's Handbook, pp. 6-7, Washington State College, Stockmen's Short Course, Dec., 1954. A summary of a lecture presented in the short course for stockmen.

*WOOL--THE WONDER FIBER W (abstract). R. A. O'Connell, Stockmen's Handbook, pp. 4-5, Washington State College, Stockmen's Short Course, Dec., 1954. A summary of a lecture presented in the short course for stockmen.

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PLANT STARCH ANALYSIS. RAPID DETERMINATION OF STARCH IN APPLES. G. H. Carter and A. M. Neubert, Jour. Agr. and Food Chem. 2(21):1070-72, Oct. 13, 1954. A rapid colorimetric starch procedure was developed for use on apples in the maturity range of commercial harvest and storage. The method is accurate for Jonathan, Golden Delicious, standard Delicious, and Winesap over this maturity range. One-fourth of the starch in these varieties appears to be amylose.

MODIFICATION OF SKIN TEXTURE OF CANNED ITALIAN PRUNES. A. M. Neubert and G. H. Carter, Food Technol. 8(11):518-522, Nov., 1954. Calcium was found to be an important factor in determining skin texture of canned Italian prunes and the presence of calcium in the canning sirup caused an increase in skin toughness of this product. Sodium hexametaphosphate, when added to the canning sirup, had a tenderizing effect and permitted standardization of skin texture. The tenderometer, when suitably adjusted, was found to provide a useful objective index of skin texture.